

MECHANISM FOR PIVOTABLY COUPLING NOTEBOOK COMPUTER AND ITS DISPLAY TOGETHER

FIELD OF THE INVENTION

5 The present invention relates to notebook computers and more particularly to an improved mechanism for pivotably coupling a notebook computer and a display thereof together.

BACKGROUND OF THE INVENTION

10 Electronics technology and material science have known a rapid, spectacular development in recent years. A wide variety of electronic products are commercially available due to the progress of electronic components manufacturing technology. As a result, manufacturing cost of the electronic products is greatly reduced, functions of the electronic products are more
15 powerful, and most importantly, quality of the electronic products are improved significantly. Moreover, miniature semiconductor devices have replaced conventional bulky electronic elements (e.g., vacuum tubes) due to the progress of semiconductor technology. Nowadays, electronic products are characterized by slimness, lightweight, and portability so as to keep up with the trend and
20 consumer demand. Further, convenience in use and popularity among vast consumers of electronic products are greatly increased. For example, many high performance, low price electronic products (e.g., notebook computers, etc.) are affordable by vast consumers.

 Conventionally, a notebook computer and a display thereof are hingedly
25 coupled together. For opening the notebook computer, a user has to pivot the display upward. To the contrary for closing the notebook computer, a user has to pivot the display downward. As to positioning of the notebook computer relative

to its display, it is not available yet. This is monotonous. Further, there is no way to adjust height of the display to be positioned at an optimum view angle. In view of the above, the well known notebook computers are unsatisfactory and lack diversity. Thus, the need for improvement still exists.

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SUMMARY OF THE INVENTION

A primary object of the present invention is to provide a mechanism for pivotably coupling a notebook computer and a display thereof together. By utilizing the present invention, the above drawbacks of the prior art can be overcome. These drawbacks are that there are no provision of positioning the display relative to the notebook computer and height adjustment of the display for positioning at an optimum view angle.

One object of the present invention is to provide a mechanism for pivotably coupling a notebook computer and a display thereof together for enabling the display to be positioned at optimum view angle and height relative to the notebook computer. In the present invention, a keyboard is received in a forward recess of a housing of the notebook computer, and a substantially rectangular pivot board is received in a rearward recess of the housing, the pivot board having a forward side hingedly coupled to the keyboard and a rearward side hingedly coupled to the display so that the display is adapted to pivot upward for adjusting height and position thereof relative to the housing.

In another aspect of the present invention a plate-shaped latch device is provided under the pivot board in the housing. The latch device comprises an elongate latch board at either side, a trigger between the latch boards, a finger tab on a top of the trigger, the finger tab being projected from an opening of the pivot board, and a latch member at an outer end of either latch board distal from the trigger, the latch members being projected from the housing to snap into side

cavities of the pivot board for securing the pivot board to the housing together. A forward movement of the trigger causes the latch members to move toward left and right sides of the housing to disengage the latch members from the pivot board for being adapted to pivot the pivot board and the display upward for adjusting the height and the position of the display relative to the housing.

In a further aspect of the present invention, there are further provided two side holes in the rearward recess of the housing, a button in either side hole, the button having an upper part protruded from the side hole and a lower part concealed inside the housing, a disk-shaped seat having a diameter slightly larger than that of the hole disposed at a lower part of either button, and a resilient element (e.g., spring) under either button, a bottom of the resilient element being urged against the bottom of the housing so that in response to the disengagement of the latch members from the pivot board, the buttons are adapted to push the pivot board upward by expanding the second resilient elements and clear the pivot board from the rearward recess of the housing.

The above and other objects, features and advantages of the present invention will become apparent from the following detailed description taken with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a notebook computer incorporating a mechanism for pivotably coupling the notebook computer to a display thereof according to the invention;

FIG. 2 is an exploded view of the mechanism;

FIG. 3 schematically shows a top plan view of an operating position of the mechanism;

FIG. 4 is a view similar to FIG. 3 showing another operating position of the

mechanism; and

FIG. 5 is a perspective view depicting height and position adjustment of the display relative to the notebook computer.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 5, there is shown a mechanism for pivotably coupling a notebook computer 10 and a display 14 thereof together in accordance with the invention. A housing 11 of the notebook computer 10 comprises a forward recess with a keyboard 12 received therein and a rearward
10 recess with a substantially rectangular pivot board 13 received therein. The pivot board 13 and the keyboard 12 are hingedly coupled together at adjacent sides thereof (i.e., at a forward side of the pivot board 13). A rearward side of the pivot board 13 is also hingedly coupled to the display 14 of the notebook computer 10. Thus, both the display 14 and the pivot board 13 are adapted to pivot upward for
15 adjusting height and position of the display 14 relative to the housing 11.

Referring to FIGS. 2 and 3 in conjunction with FIG. 1, a plate-shaped latch device 15 is disposed under the pivot board 13 in the housing 11. The latch device 15 comprises an elongate latch board 151 at either side, a trigger 152 between the latch boards 151, an elongate finger tab 153 on a top of the trigger
20 152, the finger tab 153 being projected from an opening 131 of the pivot board 13, and a latch member 154 at an outer end of either latch board 151 distal from the trigger 152, the latch members 154 being projected from the housing 11 to snap into side cavities of the pivot board 13 for fastening the pivot board 13 and the housing 11 together.

25 Referring to FIG. 4 in conjunction with FIGS. 2 and 3, the latch board 151 comprises an inclined surface 155 at one side adjacent the trigger 152. The trigger 152 comprises an inclined surface 156 at either side adapted being

5 matingly couple to the inclined surface 155 so that a forward movement of the trigger 152 causes the inclined surfaces 155 to move outward (i.e., both left and right sides of the notebook computer 10) and causes the latch members 154 to move outward to disengage the latch members 154 from the pivot board 13. At this moment, a user can pivot the display 14 upward for adjusting height and position of the display 14 relative to the housing 11 (see FIG. 5).

Referring to FIGS. 4 and 5 again, in the invention in the rearward recess of the housing 11 two side holes are provided, each with a button 17 formed therein. A disk-shaped seat 171 having a diameter slightly larger than that of the side hole is provided at a lower part of either button 17. An upper part of the button 17 is protruded from the side hole and a lower part thereof is concealed inside the housing 11. A resilient element (e.g., spring) 18 is provided under either button 17. A bottom of the resilient element 18 is urged against a bottom of the housing 11. Hence, the buttons 17 are adapted to push the pivot board 13 upward by the expansion of the resilient elements 18 in response to disengaging the latch members 154 from the pivot board 13. Eventually, the pivot board 13 clears from the rearward recess of the housing 11.

Referring to FIGS. 2, 3, and 4 again, in the invention a plurality of apertures 157 are provided on either trigger 152 so that a user can drive a plurality of fasteners (e.g., screws) through the apertures 157 to moveably fasten the trigger 152 at the bottom of the housing 11.

Referring to FIGS. 2, 3, and 4 again, in the invention a plurality of apertures 158 are provided on either latch board 151 so that a user can drive a plurality of fasteners (e.g., screws) through the apertures 158 to moveably fasten the latch board 151 at the bottom of the housing 11.

Referring to FIGS. 2, 3, and 4 again, in the invention a lateral tunnel 159 is formed at the latch member 154 of either latch board 151 facing inside of the

housing 11 and a second resilient element (e.g., spring) 1510 is anchored in the tunnel 159. An outer end of the second resilient element 1510 is biased against inside of the housing 11. Hence, a forward movement of the trigger 152 causes the latch boards 151 to move outward to disengage from the latch members 154 from the pivot board 13 by compressing the second resilient element 1510. To the contrary, a rearward movement of the trigger 152 causes the latch boards 151 to move inward to engage the latch members 154 with the pivot board 13 by expanding the second resilient element 1510.

Referring to FIGS. 1 and 2 again, in the invention two spaced first pivot tubes 132 are formed at a forward side of the pivot board 13. Two first pins 133 are inserted into the first pivot tubes 132 and the housing 11 (i.e., one ends of the first pins 133 concealed in the first pivot tubes 132 and the other ends thereof concealed in the housing 11 respectively) for pivotably coupling the pivot board 13 and the housing 11 together.

Referring to FIGS. 1 and 2 again, in the invention two spaced second pivot tubes 134 are formed at a rearward side of the pivot board 13. Two second pins 135 are inserted into the second pivot tubes 134 and the display 14 (i.e., one ends of the second pins 135 concealed in the second pivot tubes 134 and the other ends thereof concealed in the housing 11 respectively) for pivotably coupling the pivot board 13 and the display 14 together.

Referring to FIGS. 1 and 5 again, in the invention each of the housing 11, the keyboard 12, the pivot board 13, and the display 14 is made of an aluminum and magnesium alloy for forming a compact, structurally enhanced notebook computer 10.

While the invention has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the

claims.